

50-247

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SUMMARY AND CONCLUSIONS SECTION OF INDIAN POINT UNIT 2 FINAL ENVIRONMENTAL STATEMENT

The Draft Environmental Statement for the Consolidated Edison Company of New York, Inc., Indian Point Unit 2 plant, was issued on April 14, 1972, and the Statement was circulated for comment to Federal, State and local agencies. We received comments from many agencies as well as the applicant, and consideration of the comments and preparation of the Final Statement is essentially completed. I am enclosing for your information a copy of the Summary and Conclusions section of the Indian Point Unit 2 Final Environmental Statement that we propose to publish by September 21, 1972.

(signed) L. Manning Muntzing

L. Manning Muntzing
Director of Regulation

Enclosure:
As stated

- cc: General Manager (2)
- Secretariat (2)
- General Counsel (2)

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DATE	9/8/72	9/8/72	9/8/72	9/11/72	9/11/72

SUMMARY AND CONCLUSIONS

This Final Environmental Statement was prepared by the U. S. Atomic Energy Commission, Directorate of Licensing.

1. This action is administrative.
2. The proposed action is the issuance of a license to Consolidated Edison Company of New York, Inc., for the operation of the Indian Point Nuclear Generating Plant, Unit No. 2 (Docket No. 50-247), located in the State of New York, Westchester County, Village of Buchanan, 24 miles north of the New York City boundary line.

The Indian Point Station will have three Units each with a pressurized water reactor. Although the present action is concerned with the proposed issuance of a license for Unit No. 2, this Statement considers the environmental impact of the simultaneous operation of Units Nos. 1 and 2 (265 and 873 megawatts electrical, respectively). In view of the proximity of Units Nos. 1, 2, and 3 and the similarity in design of the Units, it is reasonable to expect that any and all requirements placed on Unit 2 as a consequence of this Statement will apply as well to Units Nos. 1 and 3. Nevertheless, separate studies of the environmental impact of Units Nos. 1 and 3 will be made, in which the combined effects of the Units will be taken into account, and conclusions will be drawn and recommendations made based on those studies.

3. Summary of environmental impacts, including beneficial and adverse effects, follows:
 - a. About 35 acres of 239 acres of land formerly used as an amusement park, and later zoned for heavy industry, have been converted to industrial use.
 - b. The applicant's plans to develop an 80-acre forested park with a freshwater lake and to build a new visitors' center, nature trails, gardens and public facilities will enhance the value of the site to the general public. A 14-acre area, transferred by the applicant to the Village of Buchanan, will be developed into a marina.

- c. A minimal land area was used for the right-of-way of the transmission lines from Unit No. 2 to the nearby Buchanan Substation from which the power is distributed to the applicant's system; no additional right-of-way was needed to distribute the electrical output of Unit No. 2. Transmission towers from Unit No. 2 to the Buchanan Substation were designed in accordance with Federal guidelines.
- d. In constructing Unit No. 2, the change in pattern of land use was kept to a minimum; areas disturbed during construction will be improved by landscaping and planting.
- e. About 2,650 cubic feet per second* of water for once-through cooling and service water systems will be withdrawn from the Hudson River and increased in temperature by about 15F° during passage through the steam condensers and heat exchangers of Units Nos. 1 and 2. This heated water from both Units will be combined in a common discharge canal to the Hudson River at a velocity of about 10 feet per second via a 270-foot long, submerged multiport discharge structure.
- f. The applicant's conclusion that the thermal discharges from Units Nos. 1 and 2 will meet the New York State thermal standards throughout the entire year has not been confirmed by the staff's evaluation. Although the staff's assessment shows that the thermal discharges will result in a temperature of less than 90°F at the river surface, even during the summer months, and thus meet part of the New York thermal standards, the staff finds that the New York State standards for surface area and cross-sectional area enclosed within the 4F° isotherm may not be met. Under the severest anticipated operating conditions, the staff's evaluation indicates that the area included within the 4F° isotherm will be less than 50% of the vertical cross-sectional area of the river, but the increase in temperature at the surface of the river may be more than 4F° for more than two-thirds of the surface area of the river and may even extend across the whole width of the river.

* 1 cubic foot per second (cfs) is equivalent to about 450 gallons per minute (gpm).

- g. The dissolved oxygen concentration in the thermal plume on occasion may be reduced to levels detrimental to aquatic life, principally in late summer and early fall.
- h. During the operation of Units Nos. 1 and 2 small quantities of phosphate, hydrazine, amines, boric acid, and chromate discharged into the Hudson River are not expected to produce important biological effects.
- i. Chlorination of the once-through cooling system 3 times per week for a total of 6 hours per week may result in releasing cooling water containing up to 0.5 ppm of residual chlorine. This residual chlorine (and any chloramines formed from reaction with nitrogenous materials in the river water) may be toxic to aquatic life in the thermal plume and in the immediate vicinity of the cooling water outfall.
- j. A detailed staff assessment of the biological impact of the once-through cooling system of Indian Point Units Nos. 1 and 2, using available information on the hydraulics and biota of the Hudson River estuary, shows that:
 - 1) Unless the applicant finds better means of preventing fish from entering the intake structure, fish, numbering between two to five million annually based on present population levels and composed mostly of young-of-the-year white perch and also large numbers of young-of-the-year striped bass and other fishes of about one to two inches in length, will be killed by impingement on the intake structure;
 - 2) Aquatic organisms including phytoplankton, planktonic crustaceans, larval stages of benthic invertebrates and eggs and larvae of many of the estuarine fishes such as striped bass, alewife, blueback herring, tomcod, American shad, bay anchovy, smelt, and white perch will be subject to entrainment in the cooling water and thereby exposed to mechanical, thermal, and chemical (chlorine) effects. The staff has estimated that during the summer months, an average of about 25% of those organisms passively drifting downstream will be entrained. The staff analysis further indicates that during June and July of most years from 30 to 50% of the striped bass larvae which migrate past Indian Point from upstream spawning areas are likely to be killed by entrainment. There is a high probability that the combined effects of entrainment and impingement will also result

in a similar decrease in recruitment to the adult population of striped bass in the New York, New Jersey, and New England regions. The operation of Units Nos. 1 and 2 with once-through cooling beyond 5 years could result in cumulative effects that would cause the population to decline further.

- k. Operation of Units Nos. 1 and 2 will not cause contamination of groundwater by either chemical or sanitary wastes.
 - l. Discharges of radioactive gaseous and liquid wastes to the environment during routine Plant operation will result in an insignificant radiological impact on man and natural populations of terrestrial and aquatic life.
 - m. Nearby residents will be exposed to a very low probability risk of accidental radiation exposure during abnormal operating conditions and during transport of radioactive material.
 - n. Electrical energy needed to maintain the health and welfare of the people of the New York metropolitan area and to support the economic growth of the area served by the applicant's power network will be generated by the Plant.
 - o. Operation of Unit No. 2 will allow the applicant to shut down or reduce the use of older oil-burning plants and thereby decrease the air pollution near the plants.
 - p. The local economy will be stimulated through taxes, direct employment, and visitors.
4. From review and evaluation of the applicant's Environmental Report and Supplements thereto, and from independent observations and analysis discussed in this Statement, the regulatory staff has reached the following conclusions concerning the environmental impact of the Plant's operation:
- a. The benefits of meeting an urgent need for power in the New York area in the short-term (e.g., the next 5 years) outweigh the estimated corresponding environmental costs incurred over this short-term period. The need for power for the metropolitan New York area has been adequately demonstrated in terms of decreasing reserve margins and

increasing frequency of brownouts during peak load periods of the past several summers. Indian Point Unit No. 2 will add needed new base-load capacity to the applicant's system and improve the reliability of service in the metropolitan New York area. Operation of Indian Point Unit No. 2 will also permit obsolete base-load fossil plants inside New York City to be retired, thereby improving the air quality of the City.

- b. The existing information is insufficient to predict accurately the long-term impact on all aquatic organisms. For some species this impact could be quantified by long-term field studies, but by that time irreversible damage may have been incurred.
 - c. The operation of Units Nos. 1 and 2 with the present once-through cooling system has the potential for a long-term environmental impact on the aquatic biota inhabiting the Hudson River which would result in permanent damage to and severe reduction in the fish population, particularly striped bass, in the Hudson River, Long Island Sound, the adjacent New Jersey coast, and the New York Bight. The potential impact is due to impingement of aquatic biota on the intake structure and entrainment of fish eggs, larvae, and plankton in the cooling water system resulting in exposure to severe mechanical, chemical (chlorine) and thermal stresses.
 - d. Alternatives to the applicant's proposed method of operation are available for nearly complete reduction of long-term aquatic environmental impacts without jeopardizing the needed new base-load capacity and the reliability of the applicant's service in the New York area.
5. Principal alternatives considered:
- a. Purchase of power from outside sources.
 - b. Use of fossil fuel at the same site and other sites.
 - c. Use of hydroelectric pumped-storage facilities and gas turbines for peaking purposes.
 - d. Location of the Station at other sites.

- e. Heat dissipation with wet evaporative, natural-draft and mechanical-draft cooling towers and spray ponds operated in the open- and closed-cycle mode.
 - f. Heat dissipation with dry cooling towers.
 - g. Reduction of biological damage to biota from entrainment and impingement by (1) recirculation to reduce intake flows during the winter months and (2) installation of a new off-shore screening structure sized to maintain intake velocities through the screens below 0.3 feet per second during the winter season.
 - h. Other chlorinating schedules and procedures that would reduce the adverse effects of residual chlorine and chloramines on aquatic biota.
 - i. Replacement of aquatic species damaged by operation of the once-through cooling system.
6. The Federal, State, and local agencies and interested parties listed below and the applicant responded to the Draft Environmental Statement issued on April 13, 1972.

Advisory Council on Historic Preservation
Department of Agriculture
Department of the Army, Corps of Engineers
Department of Commerce
Environmental Protection Agency
Federal Power Commission
Department of Health, Education, and Welfare
Department of the Interior
Department of Transportation
New York State Department of Environmental Conservation
New York State Office of the Attorney General
New York State Historic Trust
Westchester County Department of Planning
Citizen's Committee for the Protection of the Environment
Environmental Defense Fund
Hudson River Fishermen's Association
Natural Resources Defense Council, Inc.
Scenic Hudson Preservation Conference
Congressman J. B. Bingham
Congressman J. G. Dow
Congressman W. F. Ryan

Mr. J. M. Burns III
Mr. R. L. Ottinger
Consolidated Edison Company of New York, Inc.

7. On the basis of the evaluation and analysis set forth in this Statement and after weighing the environmental, economic, technical, and other benefits against environmental costs and considering available alternatives, the staff concludes that the action called for is the issuance of an operating license authorizing operation of Indian Point Unit No. 2 subject to the following conditions for the protection of the environment:
- a. Operation of Indian Point Unit No. 2, with the once-through cooling system, shall be permitted until January 1, 1978.
 - b. Evaluation of the economic and environmental impacts of an alternative closed-cycle cooling system shall be made in order to determine a preferred system for installation. This evaluation shall be submitted to the Atomic Energy Commission for review by July 1, 1973.
 - c. After approval by the Atomic Energy Commission, the preferred closed-cycle cooling system shall be designed, built and placed in operation no later than January 1, 1978.
 - d. Non-radiological as well as radiological, monitoring programs and limits on effluent releases will be incorporated as a requirement in the Technical Specifications to the Operating License No. DPR-26. The monitoring program will be conducted by the applicant and will include determination of the following:
 - 1) The nature and extent of the entrainment mortality and damage of aquatic organisms, after passage through the condenser;
 - 2) The nature and extent of the impingement mortality by counting the number, types, and sizes of fish collected on the screens and trash racks of the intake structure;
 - 3) Concentrations of residual chlorine, free and combined, during each chlorination period, and effects of chlorine residuals on biota;

- 4) Concentrations of dissolved oxygen in the discharge water and the thermal plume;
 - 5) The size, shape, and location of isotherms of the thermal plume with different fresh water flows during different seasons;
 - 6) Any changes in aquatic life in the Hudson River from operation of the Plant with the once-through cooling system.
- f. A plan of action for Plant operation to minimize detrimental effects on aquatic biota will be developed by the applicant by July 1, 1973. This plan should include means of reducing to a practical minimum fish kills from cold shock, impingement on the intake structure, entrainment of fish eggs, larvae and plankton, and provide for corrective measures such as aeration of the cooling water during periods when concentrations of dissolved oxygen in the thermal plume are reduced below 4.5 ppm. After approval by the Atomic Energy Commission, such a plan shall be implemented so as to eliminate or substantially reduce such effects as are revealed by the monitoring program prior to installation of a closed-cycle cooling system.
8. The applicant will assess and evaluate the environmental monitoring and study programs outlined in this Statement and in the Technical Specifications accompanying the operating license. Whenever the applicant believes he has accumulated new information which can clearly demonstrate (1) the operation of Unit No. 2 in conjunction with Unit No. 1 with the once-through cooling system will not result in an unacceptable, long-term, irreparable damage to aquatic biota; and (2) an alternative cooling system will not provide a means to reduce materially the environmental damage, or to enhance the benefits compared to the environmental costs, of the operation of the Plant as is, the Atomic Energy Commission will review and evaluate the data to determine if the question of operation of Unit No. 2 with the once-through cooling system should be reopened.
 9. This Final Statement was made available to the Council on Environmental Quality, the public, the applicant and the above-mentioned agencies in September 1972.